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SOME CORRELATES OF THE JUNGIAN TYPOLOGY:

PERSONAL STYLE VARIABLES

by

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SOME CORRELATES OF THE JUNGIAN TYPOLOGY:

PERSONAL STYLE VARIABLES

INTRODUCTION

C. G. Jung's Typology (21) is a richly described and, to the writer, intuitively reasonable method of categorizing individuals. One of its type-pairs, extraversion-introversion, has become a controversial, but apparently lasting, concept in the psychological literature. (The words "extraversion" and "introversion" have also been taken into popular culture, to denote sociophilia and sociophobia, a meaning more circumscribed than that originally intended by Jung.) The other type-pairs, thinking-feeling and sensation-intuition, have received minimal research attention despite offering, in the writer's view, as much potential for research as extraversion-introversion.

Sufficient research (some of which is reported briefly at the end of this chapter) exists to provide evidence of the potential utility of extraversion-introversion as descriptive categories. A small body of research by Myers (26) and by MacKinnon (In Myers, 26) suggests that this potential utility extends to the Typology as a whole.

It was felt that the potential utility of the Typology has become actual to the extent that a variety of personality

characteristics can be shown to be both theoretically and empirically related to it. The aim of this research was to seek further relations of this sort.

The method chosen was that of seeking correlations between a purported direct measure of the Typology (The Myers-Briggs Type Indicator) and various measures of personality characteristics derivable as theoretically related to the Typology.

Implicit in this approach is the author's view that a typology is a classification of individuals via categories superordinate to personality traits (a "trait" being a consistency in a limited area of behavior, e.g. the trait of extrapunitive, a consistency in the area of punitive style in response to frustration). Further, these categories should be more than atheoretical "trait clusters." In order that the term "typology" be used, an explanation of the categories, in terms of group differences in orientation, disposition, or the like should be offered.

A typology fulfilling the above criteria exceeds the discovery of consistent differences in traits or "trait clusters" in both heuristic and explanatory value: it suggests new traits which might be found to correlate with its categories, and it provides an explanation, at some level, of observed relationships among human personality traits. Jung meant his typology to fulfill these criteria, although its explanations were often presented with more richness than clarity, and supported by anecdotal rather than experimental evidence. In the interests of seeking clarification and

experimental support of a typology fulfilling these criteria, it seemed to the author appropriate in this research to seek correlates of the Jungian categories which were theoretically related to the explanations offered by Jung, rather than to use a more purely empirical approach.

The assumption of discrete categories often associated with the term "typology" is not made here. The existence of consistencies in the presence of certain traits in individuals is sought. No effort is made to demonstrate that a person in Jungian category A must have only traits a_1 , a_2 , a_3 , etc., while a person in Jungian category B must have only traits b_1 , b_2 , b_3 , etc. It is the author's belief that personality is sufficiently complex that it would be unreasonable to expect this. What is hoped for is a demonstration that a person in Jungian category A will be more likely than a person in Jungian category B to possess traits a_1 , a_2 , a_3 .

Choice of the Dependent Variables

The studies reported here have in common, in addition to seeking trait-correlates of the Jungian Typology, the fact that the dependent measures all measured variables of personal style.

Four types of variables applicable to the quantification of personality can readily be identified: Variables of motivation (e.g. Murray's need systems), respondents (e.g. anxiety), ability (e.g. intelligence), and personal style

(e.g. Rosenzweig's punitive styles, Barron's simple and complex persons). Of these categories, variables of personal style are perhaps the most relevant to such major efforts at categorization and description of individuals as the "neurotic," "psychotic," and "character disorder" classification of mental illnesses; Freud's oral, anal, phallic and genital characters; attempts to identify the "well-adjusted person," and, more recently, "the creative person;" and the Jungian Typology.

To further define variables of personal style, they are in a sense preferences, at the "personality trait" level of generality. They may be preferences for categories of stimuli, or preferences for styles of behavior. They are not desires for certain ends (i.e. they are not motivations), nor are they capacities to attain ends (i.e. they are not abilities). They exist independently of ends beyond themselves. In this they are like the class of variables which I have called "respondents," but differ in being consistencies in a much higher, more cognitive, level of functioning.

Variables of personal style seem particularly suitable to the Jungian Typology, which classifies a person in regard to his preferred attitudes and modes of functioning. This apparent suitability, and the relative lack of research attempting to relate the Typology to direct measures of personal style, lead to their being chosen as dependent variables in the studies reported here.

Description of the Jungian Typology

The Jungian Typology classifies a person via his position in regard to a pair of "attitudes" (extraversion and introversion) and two pairs of "functions" (the judging functions, thinking and feeling, and the perceiving functions, sensing and intuiting). Each person, according to the Typology, is either an "extravert" or an "introvert," either a "thinking type" or a "feeling type," and either a "sensing type" or an "intuiting type." The following paragraphs describe these categories in more detail.

The attitudes: extraversion and introversion. Jung calls "extraversion-introversion" the "general attitude types, since they are distinguished by the direction of general interest of libido movement" (Jung, 21, p. 412). The "general interest" of the extravert is primarily in the external world of objective reality, his preferred direction of "libido movement" is outward, while the "general interest" of the introvert is primarily in the internal world of subjective reality, his preferred direction of "libido movement" inward. The extravert prefers situations in which his response is largely determined by external reality, for when he is forced to turn inward he is uncomfortable--for him the external world is real and pleasing, while the internal world may be so only insofar as he can see it as a response to external reality, only insofar as there are "facts" to back it up. Conversely, the introvert is threatened by situations in which the demands of external

reality are great--for him, the internal, subjective world is real and pleasing, while the external world may be so only as an undemanding stimulus and respondent to his thoughts and ideas. For the extravert, a theory is merely an ordering of the facts; for the introvert, a fact is merely a bit of evidence for a theory.

To illustrate, in philosophy, the extravert would be the empiricist, the introvert the rationalist. In science, the extravert would develop theories only to organize data, while the introvert would gather data only to illustrate a theory. The extravert would be more likely to go into business, manufacturing, selling, the theater, occupations emphasizing active intercourse with the external world; the introvert would be more likely to go into philosophy, academic work, writing, painting, occupations emphasizing involvement with one's subjective world. At a sports event the extravert would enjoy what was happening, the introvert his own responses to what was happening. After the sports event, the extravert would be interested in who won, the introvert in why they had won.

The non-existence of pure types. It should be noted that there could not be a pure extravert nor a pure introvert. The extravert may be able to enjoy his personal responses only to the extent that he can act on them, and thus experience them in the external world, but he still has personal experiences; and he may trust his ordering of the universe only to the extent that he can see it clearly reflected in external reality, but he still orders reality. Similarly, the introvert

may enjoy external events only to the extent that they fit into his subjective world, but he still enjoys external events; and he may comfortably communicate with other people only to the extent that the ideas they represent are congruent with his own ideas, but he still must communicate with other people. The extraverted businessman may gain satisfaction primarily from the fact of the growth of his business in accord with his own ideas, but the ideas are his, and proceed from within. (As an extravert, he may prefer to get his ideas from the external world, from market research, say, but it is still his interpretation of the findings that he acts upon.) The introverted academician may gain satisfaction primarily from participation in his own ideas, but he still teaches them and publishes them. (If he teaches and publishes only of necessity, he would still choose to see his ideas evidenced by data, to write them down, or at least to share them with a friend.)

(Perhaps the closest approach to a pure extravert would be the psychopath, for whom external expedience is all-important, internal standards and ideas of minimal importance; while the closest approach to the pure introvert would be the schizophrenic, predominantly responsive to his internal world.)

The above-discussed absence of a "pure type" applies to the functions as well, and will not be discussed further. It is inherent in Jung's theory, in which one's status with regard to type identifies the attitude and functions which are emphasized in consciousness, the rest being assumed to be repressed but still present. Every extravert will not behave

like an extravert, nor every feeling-type like a feeling-type, etc. in every situation--the repressed tendencies are always present to be released by the proper combination of situation and needs of the individual. This characteristic of the Typology is discussed particularly in relation to "extraversion-introversion" because it is the author's belief that existing measures of the attitudes fail to take it properly into account, measuring only social "extraversion-introversion" (i.e. the presence of extraverted or introverted tendencies in a particular type of situation, the social) rather than the general attitudes of "extraversion-introversion" described by Jung. The Myers-Briggs Type Indicator, used in the research reported here, is no less at fault--while its "thinking-feeling" and "sensing-intuiting" items appear to be relevant across areas, its "extraversion-introversion" items appear, with a few exceptions, to be specifically related to the social situation.

Returning to the description of the Typology, the nature of the functions can be more briefly stated, as they are more easily grasped. The probable reason for this is that the common-language usage of the terms "extraversion" and "introversion" (to denote social extraversion and introversion) is misleading, whereas the common meanings of the words "thinking," "feeling," "sensing," and "intuiting" suggest the nature of those Jungian categories.

The judging functions: thinking and feeling. Knowing a person's type relative to these functions identifies for us his consciously preferred style of judging. "Hence feeling

is also a kind of judging, differing, however, from an intellectual judgment, in that it does not aim at establishing an intellectual connection but is solely concerned with the setting up of a subjective criticism of acceptance or rejection" (Jung, 21, p. 544). The essence of Jung's differentiation between thinking and feeling is that thinking involves the use of objective (i.e. explicit) criteria, while feeling involves the use of subjective (i.e. implicit) criteria. This would seem to suggest a relationship between thinking and extraversion, and between feeling and introversion, but Jung did not mean that to be the case. The criteria used in a thinking judgment are explicit in the sense that they are consciously known to the thinking type, although in the case of the introverted thinking type, they will have proceeded initially from within. Similarly, the criteria used in a feeling judgment are implicit in the sense that they are not consciously known to the feeling type, although in the case of the extraverted feeling type they will have proceeded initially from without.

To illustrate (borrowing from Jung), in response to a painting hung in someone else's home, a thinking type would decide that it was a good painting, a feeling type would feel that he liked it. An extraverted thinking type might base his decision on the facts that its owner was a man of known good taste, that it was by an artist of note, or that it complied with certain rules of painting that he had learned, while an introverted thinking type might base his decision on the fact that it complied with certain rules of painting that he had

developed; but in each case a decision would be made, based on facts which were explicit (i.e. consciously known) to the thinking type person at the time he made the decision. In the case of the feeling types, neither the extravert nor the introvert would know, at the time he had the feeling of liking the painting, wherein the feeling was based; the criteria for the feeling types would be implicit (i.e. not consciously known) at the moment of their response to the painting. In fact, the extraverted feeling type's response may have been based on a feeling that he would please the painting's owner, or some cultural standards of beauty, by liking the painting, while the introverted feeling type's response may have been based directly on his perception of the painting itself.

I have used such phrases as "at the moment of . . . response," in regard to the use of different types of criteria by thinking and feeling types, with reason. In western culture, one is encouraged to behave like a thinking type, to give explicit reasons for one's decisions and preferences. Feeling types, under this pressure, may be heard to give elaborate rationales for their decisions, but, if they are true feeling types, at the moment of response the rationales were not conscious, they were developed after the fact of the response.

The perceiving functions: sensing and intuiting.

Categorizing a person with regard to this pair of functions identifies his consciously preferred style of perceiving. A perceptive response to an object differs from a judging

response, in Jungian terms, in having "the character of being given, in contrast to the 'derived' or 'deduced' character of feeling and thinking contents" (Jung, 21, p. 568). Sensation and intuition are not styles of response to an object, as are thinking and feeling, so much as perceptions of an object. They lack the mediated character of judgments, instead possess "an intrinsic character of certainty and conviction" (Ibid.). For the term "perception," as for the term "judgment," Jungian usage and common usage are similar.

The two styles of perceiving differ in that intuition "transmits perceptions in an unconscious way" (Ibid.). It may involve the perception of subliminal facts about the object (e.g. a pattern which cannot be made explicit by the intuitive perceiver), or the instantaneous association of unconscious "facts" with the object. In either case, intuitive perception involves a going-beyond the obviously, consciously given nature of the object, simultaneous with the "sense-perception" of the object. Sensing perception differs in lacking this going-beyond, for which lack it may compensate with a more accurate or more detailed "sense-perception."

To illustrate, let us again use the example of a painting, in this case an abstract. A sensation type may see this painting as a black expanse with several objects, some red, some green, some roughly square, some roughly triangular, arranged upon it. An intuitive type may see the same painting as a pattern of forms appearing to move outward, to be alternately warm and cool, etc. The sensation type prefers to see what is

there, the intuitive type what could be there.

It should be clear from the foregoing descriptions that the Jungian Typology fulfills our criterion of a typology, in that its categories are superordinate to personality traits, and are more than 'atheoretical trait clusters.' As such, it is immediately potentially more useful than a categorization in regard to specific traits. As such, also, the appropriate method of investigating its practical usefulness is the seeking of correlations between each of its categories and a variety of theoretically related traits. To the extent that a variety of relatively independent traits can be shown to be both theoretically and empirically related to each of its categories, to that extent will it be demonstrated to be an useful typology, and to offer the insights into the organization of personality that this entails. Before reporting our own attempts to relate a variety of traits to the Typology, a brief review will indicate the extent to which this has been accomplished in the existing literature.

Existing Research Relating Traits to the Typology

Little, if any, research has been done related to Jung's four functions, beyond that done by Mrs. Myers in developing the Myers-Briggs. Conversely, a great deal of research has dealt with extraversion-introversion, but most of this research has not been intended to test hypotheses derived directly from Jung. Those experiments reporting correlates of extraversion-introversion relatable to Jung's

description of the attitudes are mentioned below.

Extraversion (vs. introversion) has been related to such obvious correlates of social extraversion as leadership and popularity (Mann, 24) and group influence (Rim, 29). More interesting are findings relating extraversion to traits more readily predictable from Jungian extraversion than from social extraversion. These include activity rate (Mann, 24), tough-mindedness, which involves a lack of respect for subjective factors (Eysenck, 14), body sway in response to suggestion (Furneaux, 19), and graphic expansiveness (Wallach and Gahm, 35).

(In the case of the latter two traits, the relationship only held for relatively normal (low neuroticism) subjects. For neurotic subjects the relationships reversed, body sway and graphic expansiveness being related to introversion. Wallach offers a persuasive argument for explaining this reversal in terms of anxiety (neuroticism) reflecting the presence of repressed extraverted tendencies in the neurotic introverts. This argument will be discussed in relation to a similar finding in the research reported in this paper.)

Another finding more predictable from Jung's description of the attitudes than from social extraversion-introversion is Eysenck's (9) finding that extraverts tend to prefer "overt" humor relating to satisfaction of the appetites, while introverts tend to prefer more "cognitive" humor.

In the same work, Eysenck reports finding poorer vocabularies among extraverts than introverts at the same IQ

level. (This was found in a neurotic population.) This could be explained by a greater investment by introverts in the internal world of symbols.

Five recent findings indicate a relation between extraversion and what is clinically called "acting out." Keehn (22) found extraversion to be related to accident-proneness, Fine (16) found it to be related to traffic violation, Pierson and Kelly (27) to delinquency, Seigman (33) to antisocial behavior in males, and Michael (25) to the committing of crimes.

A body of research exists dealing with Eysenck's "cortical inhibition" theory of extraversion-introversion. The theory is that extraverts will generate more "cortical inhibition," and dissipate it more slowly, than introverts. By "cortical inhibition" Eysenck means a damping-down of brain activity. Introverts, with less of this damping-down process, according to the theory, are more sensitive to external stimuli, and this is the basis of their withdrawal. The theory is ambiguously and confusingly stated, and it appears to the writer that opposed findings are taken by Eysenck and his followers as supporting the theory. At any rate, findings in support of the theory are claimed by Eysenck (10, 11, 12, and 13) and Franks (17 and 18), while findings disputing the theory are claimed by Becker (4), Farber (15), and Rechtschaffen (28).

THREE STUDIES RELATING VARIABLES OF PERSONAL STYLE TO THE JUNGIAN TYPOLOGY

The three studies reported here have in common the seeking of correlates between the Jungian Typology and variables of personal style. Apart from this and certain aspects of methodology (the use of the Myers-Briggs Type Indicator to locate the subjects in the Typology, and the use of a "neuroticism" score on the Rotter Incomplete Sentences as a moderator variable), they are quite separate and so will be reported separately.

The Myers-Briggs Type Indicator (26) categorizes a subject in the Jungian Typology via three scales of forced-choice self-descriptive items, an extraversion-introversion (E-I) scale, a thinking-feeling (T-F) scale, and a sensing-intuiting (S-N) scale. It identifies the dominant function via a fourth scale, the judging-perceiving (J-P) scale. For further description, and discussion, of the Myers-Briggs, see Appendix A.

From the Rotter Incomplete Sentences (32) a "neuroticism" measure is obtained. The Rotter consists of forty stems which are completed by the subject. Each completion is scored

from 0 to 6 as to "conflict," the total score for a subject being considered an "index of maladjustment," a "neuroticism" score. (For further information on the Rotter see Appendix B.)

It was felt that subjects scoring high on neuroticism would be reflecting a high degree of conflict and dissatisfaction, with a resultant inconsistency of life-style. Of interest to us was the possibility that this inconsistency would extend to expression of type. Our expectation was that the elimination of high-neuroticism subjects might sometimes reveal patterns which had been masked by the inconsistency in those subjects.

To clarify this in Jungian terms, Typology classification refers to consciously preferred tendencies. In every person, according to Jung, the opposite tendencies exist compensatorially in the unconscious. That is, the conscious extravert has unconscious tendencies toward introversion, the conscious thinking type unconscious tendencies to make feeling judgments, and the conscious sensation type unconscious tendencies to perceive intuitively; and vice versa. Thus a repressed tendency to behave in opposition to one's type is always present.

If it is accepted that neuroticism reflects a discomfort with one's consciously preferred life-style, resulting from a partial breakdown of repression, the usefulness of a neuroticism moderator in any research with the Typology becomes clear. If Jung is correct, repressed tendencies in regard to type are always the opposite of one's consciously preferred tendencies. Therefore, we would expect a subject to have a

tendency to behave in opposition to his (conscious) type to the extent that he was neurotic. High neurotic subjects, then, will be less consistent in their behavior in relation to type. They will behave in opposition to their type to the extent that a situation makes behavior in accord with their type difficult, or makes expression of their repressed opposite tendencies easy.

Study I. Painting Preferences

Hypotheses

The richness of Jung's description of his Typology makes possible the derivation of many predictions in regard to artistic preferences. For this study, predictions were derived which were empirically testable via objective measures. Our hypotheses were the following:

Hypothesis 1: Extraverts should prefer representational paintings, as compared to abstract paintings, to a greater extent than introverts. To quote the earlier description of the attitudes, "the 'general interest' of the extravert is primarily in the external world of objective reality . . . while the 'general interest' of the introvert is primarily in the internal world of subjective reality." A representational painting depicts the objective world (albeit as modified by the artist's subjectivity) and should be relatively more attractive to the extravert. An abstract painting depicts the artist's subjective world (albeit it is an objective representation of

that subjective world) and should be more attractive to the introvert.

If it is argued that even an abstract painting is, to the perceiver, entirely objective, I would reply that the abstract painting encourages a more subjective response.

Hypothesis 2: Sensation types should prefer representational paintings, as compared to abstracts, to a greater extent than intuitive types. This hypothesis was suggested by Knapp and Wulff's similar (23) finding for a group of male undergraduates. They found preference for abstract art to be associated with high scores on "aesthetic interest" on the Allport-Vernon Study of Values, the College Boards, and the Terman Concept Mastery Test, as well as with N on the Myers-Briggs, and take this to indicate that "devotees of abstract art represent a more talented, sensitive and symbolically adroit group than those preferring the older, more representational tradition." While granting that this may be the case, our hypothesis is justified strictly in terms of the Typology: Intuitive perception "may involve the perception of subliminal facts about the object (e.g. a pattern which cannot be made explicit by the intuitive perceiver), or the instantaneous association of unconscious 'facts' with the object." The appreciation of an abstract painting is more dependent on this sort of perception than is the appreciation of a representational painting (in which the patterns and associations are given more explicitly by the contents), and should be relatively more available to the intuitive perceiver.

Hypothesis 3: Extraverts should prefer paintings in which people were predominantly depicted to a greater extent than introverts. This is a derivation of social extraversion-introversion, which in turn is a derivation (made explicit by Jung) of Jungian extraversion-introversion. The extravert prefers to direct his libido outward, and therefore finds people, as a group the most powerful attractors of libido yet discovered, in general pleasing. The introvert, preferring to direct his libido inward, finds the external demands of people in general threatening. The extravert, finding people in general pleasing, should find paintings depicting them pleasing; the introvert, threatened by people in general, particularly by people unknown to him, should find paintings depicting them less pleasing.

Method

Sixty-four students in an introductory psychology course, who had previously taken the Myers-Briggs type indicator and the Rotter Sentence Completion test, were shown slides of 40 paintings. The slides were shown in random order, for 20 seconds each. The subjects were asked to rate each painting from +3 ("Like very much") to -3 ("Dislike very much").

The paintings were selected via the following criteria:

- a) They were the work of a major 19th or 20th century artist.
- b) They were in color.
- c) They were obviously categorizable as either abstract or representational in style. An "abstract" painting was one in which no

object was recognizable nor clearly suggested. A "representational" painting was one in which a recognizable, real-world scene was depicted in relatively undistorted style. Twenty abstract and twenty representational paintings were selected.

- d) Within the representation category, ten paintings were selected as having "people prominent" in their subject matter, (portraits, or small groups in which individuals were clearly depicted) and ten as having "people not prominent" (landscapes, seascapes, etc.). One "people prominent" and one "people not prominent" by each artist were selected.

The forty paintings used are listed in Appendix C.

For each subject the following scores were obtained:

1. A "preference for representational" score, consisting of the total of his ratings of the twenty representational paintings minus the total of his ratings of the twenty abstract paintings.
2. A "preference for people prominent" score, consisting of the total of his ratings of the ten "people prominent" representational paintings minus the total of his ratings of

the ten "people not prominent" representational paintings.

Results

The results of Study I are comparisons of extraverts vs. introverts, and sensation vs. intuition types, in regard to their "preference for representational"¹ paintings, and of extraverts vs. introverts in regard to their "preference for people prominent"¹ paintings. These comparisons are reported in the form of chi squares. Each of the comparisons is made for three populations, the subject population as a whole, the "low neurotic" half of the population (those with Rotter scores below the median), and the "high neurotic" half of the population (those with Rotter scores above the median). Thus there are nine chi squares in all, each presenting one of the three comparisons for one of the three populations.

The chi square method of analysis was used because equal-interval scaling of the dependent variable scores, an assumption of the t-test, could not be assumed for our data.

The chi squares were formed by including in the upper quadrants, i.e., the "high preference for representational" and "high preference for paintings with people prominent" quadrants, those subjects who scored above the median (for the subject population as a whole) of the relevant dependent variable. The lower quadrants, of course, included the remainder of the subjects, those scoring below the medians.

1. The formal definitions of these preferences are given on page 21.

The comparisons of extraverts vs. introverts in regard to "preference for representational" paintings reveal no significant differences in the case of any of the three populations (See Tables I, II and III). In terms of our data, the extraversion-introversion dimension appears to make no significant difference in regard to this variable.

The comparisons of sensation types vs. intuition types in regard to this variable are more interesting. For the whole population, the difference appears to be in the predicted direction (i.e. a more frequent preference for representational paintings by sensation types) but the chi square does not attain statistical significance (Table IV). For the "low neurotic" half of the population, from whom we expected the greatest consistency of type-expression, the difference remains in the predicted direction, and for this population the chi square is significant at the .06 level of confidence: Among "low neurotic" subjects, sensation types show a significantly more frequent preference for representational paintings than intuition types, as predicted (Table V). For the "high neurotic" half of the population, no difference in preference for representational paintings between sensation and intuition types is seen (Table VI).

In the case of the comparison of sensation vs. intuition types in regard to the variable of preference for representational paintings, we see (above) that the "high neurotic" subjects functioned as "noise" in the population as a whole, partially masking the difference clearly seen in the "low

neurotic" half of the population. The value of the neuroticism moderator is evident here, and perhaps even more so in regard to the following comparisons.

Before application of the neuroticism moderator, the comparison of extraverts vs. introverts in regard to their preference for paintings with people prominent appears, initially, to yield little. The chi square for this comparison, for the population as a whole, shows no directionality whatever (Table VII). However, applying the neuroticism moderator, the data become highly interesting. For the "low neurotic" half of the population, extraverts differ from introverts in the predicted direction, showing a significantly (beyond the .05 level) more frequent preference for paintings with people prominent (Table VIII). For the "high neurotic" half of the population, the opposite relation (beyond the .10 level of significance) is found (Table IX). The "reversal" interaction effect is, of course, highly significant; its implications are discussed in the discussion section of this chapter.

The presence of many more extraverts in the "low neurotic" half of the population, and many more introverts in the "high neurotic" half of the population, might be seen as a possible source of bias by some. (This relationship between extraversion-introversion and the Rotter was expected, and may be seen as either a bias against introversion built into the Rotter, or a genuine greater tendency to neuroticism among introverts in this population, depending on one's definition of "neuroticism"). To reassure ourselves that our results were not a product of such a bias, additional chi squares were

done for "low neurotic" and "high neurotic" populations in each of which the number of extraverts and introverts had been roughly equalized, by applying neuroticism medians obtained separately for extraverts and introverts. (The Rotter median score for extraverts, considered separately, was 122 1/2; for introverts, considered separately, it was 142 1/2.)

The patterns seen when these newly defined "low neurotic" and "high neurotic" populations are considered are the same. No relation between extraversion-introversion and preference for representational paintings is seen (Tables X and XI). A relation between extraversion and preference for paintings with people prominent is seen in the "low neurotic" half of the population (Table XII), and the opposite relation is seen in the "high neurotic" half of the population (Table XIII).

Table I. Preference for Representational Paintings: Es vs. Is
Whole Population

	E	I	
Hi preference for representational	15	17	32
Lo preference for representational	15	17	32
	30	34	64

$$\chi^2 = 0$$

Table II. Preference for Representational Paintings: Es vs. Is
Low-neurotic Half of the Population

	E	I	
Hi preference for representational	12	5	17
Lo preference for representational	9	5	14
	21	10	31

$$\chi^2 = .16$$

Table III. Preference for Representational Paintings: Es vs. Is
High-neurotic Half of the Population

	E	I	
Hi preference for representational	3	12	15
Lo preference for representational	6	12	18
	9	24	33

$$\chi^2 = .75$$

Table IV. Preference for Representational Paintings: Ss vs. Ns
Whole Population

	S	N	
Hi preference for representational	17	15	32
Lo preference for representational	12	20	32
	29	35	64

$$\chi^2 = 1.58$$

Table V. Preference for Representational Paintings: Ss vs. Ns
Low-neurotic Half of the Population

	S	N	
Hi preference for representational	12	5	17
Lo preference for representational	5	9	14
	17	14	31

$$\chi^2 = 3.79; p < .06$$

Table VI. Preference for Representational Paintings: Ss vs. Ns
High-neurotic Half of the Population

	S	N	
Hi preference for representational	5	10	15
Lo preference for representational	7	11	18
	12	21	33

$$\chi^2 = .14$$

Table VII. Preference for Paintings with People
Prominent: Es vs. Is

Whole Population

	E	I	
Hi preference for paintings with people prominent	15	17	32
Lo preference for paintings with people prominent	15	17	32
	30	34	64

$$\chi^2 = 0$$

Table VIII. Preference for Paintings with People
Prominent: Es vs. Is

Low-neurotic Half of the Population

	E	I	
Hi preference for paintings with people prominent	13	2	15
Lo preference for paintings with people prominent	8	8	16
	21	10	31

$$\chi^2 = 4.64; p < .05$$

Table IX. Preference for Paintings with People
Prominent: Es vs. Is

High-neurotic Half of the Population

	E	I	
Hi preference for paintings with people prominent	2	15	17
Lo preference for paintings with people prominent	6	9	15
	8	24	32

$$\chi^2 = 3.39; p < .10$$

Table X. Preference for Representational Paintings: Es vs. Is
 Rotter median for Es (122 1/2) and Is (142 1/2)
 calculated separately

Low-neurotic Halves of E and I Populations

	E	I	
Hi preference for representational	7	8	15
Lo preference for representational	9	10	19
	16	18	34

$$\chi^2 = .004$$

Table XI. Preference for Representational Paintings: Es vs. Is
 Rotter median for Es (122 1/2) and Is (142 1/2)
 calculated separately

High-neurotic Halves of E and I Populations

	E	I	
Hi preference for representational	8	9	17
Lo preference for representational	6	7	13
	14	16	30

$$\chi^2 = .005$$

Table XII. Preference for Paintings with People Prominent: Es vs. Is. Rotter median for Es (122 1/2) and Is (142 1/2) calculated separately

Low-neurotic Halves of the E and I Populations

Hi preference for paintings with people prominent
Lo preference for paintings with people prominent

E	I	
10	6	16
6	12	18
16	18	34

$$\chi^2 = 2.97; p < .10$$

Table XIII. Preference for Paintings with People Prominent: Es vs. Is. Rotter median for Es (122 1/2) and Is (142 1/2) calculated separately

High-neurotic Halves of the E and I Populations

Hi preference for paintings with people prominent
Lo preference for paintings with people prominent

E	I	
4	10	14
10	6	16
14	16	30

$$\chi^2 = 3.36;$$

$$p < .10$$

Discussion

Hypothesis 1 was not confirmed. This, perhaps, should not surprise us, in light of the fact that Knapp and Wulff (23) had previously failed in an attempt to relate extraversion as measured by the Myers-Briggs to a preference for representational paintings.

The explanation for this non-finding which comes readily to mind is the apparent fact, discussed in the Introduction, that the Myers-Briggs E-I scale is heavily loaded on social extraversion-introversion items, rather than extraversion-introversion in the Jungian sense. One would not expect social extraversion vs. introversion to be related to a preference for representational art, since the social extravert does not necessarily exceed the social introvert in interest in the external world, but only in interest in other people. (One would expect social extraversion to be related to a preference for artistic representations of people--Hypothesis 3, which was confirmed.)

Adding to the attractiveness of the above explanation is the fact that the correlates of Myers-Briggs extraversion found in the studies reported here are more readily understandable in terms of social than Jungian extraversion, while correlates of more purely Jungian extraversion were not found.

However, it has been granted by the writer that social extraversion-introversion tends to be highly correlated with Jungian extraversion-introversion, and that the Myers-Briggs thereby serves as an indirect measure of the latter. As such,

it would correlate with the stronger correlates of Jungian extraversion-introversion. (For example, Myers (26) reports the correlation of "economic interest" with Myers-Briggs extraversion, and of "order" with Myers-Briggs introversion. These relationships are readily understandable only in terms of Jungian extraversion-introversion.)

If a relation between Jungian extraversion and representational art does exist undiscovered, it is a relatively weak one. The weakness of this (presently hypothetical) relation could be explained by the intrusion of other type-related factors in art preferences. For instance, Eysenck (8) reports a relationship between extraversion and preference for "brightness" in paintings. ("Brightness" was probably more characteristic of the abstract than the representational paintings used in our study.)

Hypothesis 2, the relation of sensation-type to preference for representational art, was confirmed, for the low-neurotic subjects. The lack of confirmation among high-neurotic subjects may be explained by the high degree of conflict, and resultant inconsistent expression of type, earlier hypothesized for high-neurotic subjects. The relation for the whole subject population, including both low and high neurotic subjects, was in the right direction, but did not approach significance.

This finding replicates a similar finding by Knapp and Wulff (23).

The findings in regard to Hypothesis 3 are extremely interesting. For the low-neurotic subjects the hypothesis, that extraversion should be related to a preference for paintings in which people are prominent, was clearly confirmed. However, among the high-neurotic subjects the relation is in the opposite direction of that predicted (introversion is related to a preference for paintings in which people are prominent), at a near-significant level. Because of this reversal, the population as a whole shows no directionality whatever.

This reversal, under the influence of neuroticism, was not a formal hypothesis. However, it was considered a possibility in light of Wallach's (35, 36) formulation of the relation of anxiety to inconsistency of personality expression.

The hypothesis on which we based our use of a neuroticism score as a moderator was that high neuroticism reflected conflict, and would therefore be related to inconsistent expression. Wallach goes beyond this, to suggest the dynamics of the inconsistency.

According to Wallach the high-anxiety (or neurotic) person is one whose needs do not find expression in his overt behavior. For such a person, covert behavior serves a displacement function, expressing those needs which cannot find expression in overt behavior.

Therefore, while in the low-neurotic person we would expect covert behavior to be similar to overt behavior, since it reflects the same needs, in the high-neurotic person we

would expect covert behavior to be opposite to overt behavior, since it reflects those needs which are not being expressed in overt behavior.

Wallach took graphic expansiveness-constriction as his instance of covert behavior. He predicted, and found, graphic expansiveness in socially constricted, high-neurotic individuals, and graphic constrictedness in socially expansive, high-neurotic individuals.

Using the same model, we could explain our finding, taking response to paintings as our instance of covert behavior, and the sort of social behavior dealt with in the Myers-Briggs E-I items as our instance of overt behavior. The high-neurotic extravert on the Myers-Briggs would be seen to be giving covert expression to his need for withdrawal from people in his negative response to "people prominent" paintings. Similarly, the high-neurotic introvert on the Myers-Briggs would be seen to be giving covert expression to his need to move towards people in his positive response to people-prominent paintings.

An experiment by Cerbus and Nichols (5) is relevant to the finding (among low-neurotic subjects) of a relationship between extraversion and a preference for paintings in which people are prominent. Cerbus and Nichols categorized paintings as depicting people or objects, and related preferences for each category to several personality measures. They found preference for people to be correlated with "Dominance," "Capacity for Status," and "Social Presence" (on the CPI),

which sound like correlates of extraversion, while preference for objects was correlated with "withdrawal" (on the MSRPP), clearly a correlate of introversion. Their results, that is, appear to be supportive of our finding.

Study II. Punitive Styles

Hypotheses

In regard to Rosenzweig's punitive styles (extrapunitiveness, intropunitiveness, and impunitiveness), a relationship between extraversion and extrapunitiveness, and between introversion and intropunitiveness, seemed clearly derivable from the theory, when Miller and Dollard's (7) frustration-aggression hypothesis was taken into account.

Miller and Dollard held that aggression was a response to frustration. A person's aggression should tend to be directed towards the source of his frustration (though interfering factors may lead to displaced expression of aggression, the general tendency should be that it be directed toward the source of frustration, to the extent that other factors do not interfere).

Rosenzweig named three styles of punitiveness in response to frustration, each characterized by a direction of aggression: extrapunitiveness, "in which aggression is turned on the environment" (Rosenzweig et al., 31, pp. 45-46), intropunitiveness "in which it is turned by the subject upon himself" (Ibid., p. 46), and impunitiveness, "in which

aggression is evaded in an attempt to gloss over the frustration" (Ibid.).

In accord with Miller and Dollard's hypothesis, that aggression is a response to frustration and will tend to be directed towards the perceived source of frustration, we would expect those people to use the extrapunitive style ("in which aggression is turned on the environment") who perceive the source of frustration to be the environment. Similarly, we would expect those people to use the intropunitive style ("in which it is turned by the subject upon himself") who perceive the source of frustration to be within themselves.

Thus, the hypothesis that was the primary stimulus for this study:

Hypothesis 1: Extraverts should tend to be extrapunitive and introverts to be intropunitive. The extravert's general interest is primarily in the external world, or the environment. For him, the environment is more real than his internal world and, finding himself frustrated, he would tend to perceive the real source of frustration as being the environment. He would therefore tend to direct his aggression onto the environment, i.e., to be extrapunitive.

Conversely, the introvert's interest is primarily in the internal world, which for him is more real than the external environment. Finding himself frustrated, the introvert would tend to perceive the real source of frustration as being within himself. He would therefore tend to turn his aggression upon himself, i.e., to be intropunitive.

Initially, the foregoing was our only strong hypothesis. Additionally, it was felt that the style of punitive response to a frustrating situation would clearly be related to the way in which the situation was perceived and evaluated, and that therefore relations between the perceiving and judging functions and punitive style might be expected. The theory (Typology) was not tight enough to predict the nature of the relationships that might be found between the functions and punitive style (opposing hypotheses could be generated for each function pair) but the potential relevance of the functions was clear.

Method

One hundred students in an undergraduate course in personality were given the Myers-Briggs, the Rotter Incomplete Sentences, and a forced-choice modification of the Rosenzweig Picture-Frustration Study. The standard form of the Rosenzweig P-F Study consists of 24 cartoons depicting frustrating interpersonal situations; the subjects are asked to fill in the speech-balloon above a character who is responding to frustration. The forced-choice modification of this device was developed to simplify and objectify scoring, to expedite its use with large populations. For a description of the forced-choice modification, see Appendix D.

The subjects were given the standard Rosenzweig P-F Study booklet, and with it a sheet giving six alternative responses for each of the 24 cartoons in the booklet, and an answer sheet. They were asked to mark on their answer sheet, for each of the 24 cartoons, the response, of the six alterna-

tives given for that item, that they would be most likely to actually make in a situation such as the one depicted. The instructions emphasized this, that the response chosen should be the one they would be most likely to actually make (rather than the one they thought they ought to make, etc.) because it was felt that the types would best differentiate themselves in a real interpersonal situation. Since a measure of response in a real interpersonal situation was impossible to obtain, the attempt was made to sample such response on the Rosenzweig. Also, it was felt that error variance would be reduced by the emphasis of any consistent set in regard to the Rosenzweig.

In order to test our hypothesis, an "intropunitiveness" score, consisting of the total number of responses in the intro-punitive category minus the total number of responses in the extrapunitive category, was obtained for each subject.

Results

Since an over-all tendency to choose more intropunitive than extrapunitive alternatives was found among our subjects, and since no subject groups differed significantly in regard to the number of impunitive alternatives chosen (all groups chose impunitive alternatives for about one-third of the items, dividing the remainder between intropunitive and extrapunitive alternatives), the dependent variable used in Study II was actually an "intropunitiveness" score. This score consisted, for each subject, of the number of intropunitive alternatives chosen minus the number of extrapunitive alternatives chosen.

The method of analysis again is chi square, since the assumption of equal interval scaling cannot be made. The chi squares are formed by including in the upper, or "intropunitive," quadrants, those subjects whose "intropunitiveness" score was greater than the median ($2\frac{1}{2}$) for all subjects. The remaining half (approximately) of the subjects, those whose intropunitiveness score was below this median, are included in the lower, or "extrapunitive," quadrants.

The "low neurotic" and "high neurotic" halves of the population are defined by the median Rotter score.

Tables XIV, XV and XVI present the comparisons of extraverts vs. introverts. Contrary to our hypothesis, extraverts are seen to be more often intropunitive than introverts when the population as a whole is looked at (Table XIV), and this is the case also for the "low neurotic" half of the population considered separately (Table XV).

In the "high neurotic" half of the population separately, no significant relationship between extraversion-introversion and punitive style is found (Table XVI). Again, as in two cases in Study I, the "high neurotic" half of the population is functioning as "noise;" again the value of a neuroticism moderator is evident.

A striking difference between thinking and feeling types in regard to punitive style is seen in Tables XVII, XVIII, and XIX, feeling types much more often being intropunitive. For the population as a whole (Table XVII), the differ-

ence is highly significant ($p .005$). In addition to being highly significant, the tendency holds for both the "low neurotic" (Table XVIII) and "high neurotic" (Table XIX) halves of the population considered separately, and we take it, therefore, to be a highly reliable finding.

The greater significance of the above relationship in the "high neurotic" than in the "low neurotic" half of the population may be noted. This appears to be a product of an exaggerated tendency to be extrapunitive among "high neurotic" thinking types.

The sensation-intuition dimension does not appear to have any simple effect on this personal style variable, no significant relations between these functions and punitive style being found (Tables XX, XXI, and XXII).

An over-all tendency to more intropunitiveness among "low neurotic" subjects is parenthetically noted. This is probably simply a product of the Rotter scoring, which tends to score overtly angry responses as more neurotic than intro-punitive responses.

Table XIV. Punitive Style: Es vs. Is

Whole Population

	E	I	
Intropunitive	27	19	46
Extrapunitive	17	32	49
	44	51	95

$$\chi^2 = 5.52; p < .025$$

Table XV. Punitive Style: Es vs. Is

Low-neurotic Half of the Population

	E	I	
Intropunitive	20	8	28
Extrapunitive	9	12	21
	29	20	49

$$\chi^2 = 3.98; p < .05$$

Table XVI. Punitive Style: Es vs. Is

High-neurotic Half of the Population

	E	I	
Intropunitive	7	11	18
Extrapunitive	8	20	28
	15	31	46

$$\chi^2 = .49$$

Table XVII. Punitive Style: Ts vs. Fs

Whole Population

	T	F	
Intropunitive	7	41	48
Extrapunitive	21	27	48
	28	68	96

$$\chi^2 = 9.80; p < .005$$

Table XVIII. Punitive Style: Ts vs. Fs

Low-neurotic Half of the Population

	T	F	
Intropunitive	5	24	29
Extrapunitive	8	12	20
	13	36	49

$$\chi^2 = 3.17; p < .10$$

Table XIX. Punitive Style: Ts vs. Fs

High-neurotic Half of the Population

	T	F	
Intropunitive	2	17	19
Extrapunitive	13	15	28
	15	32	47

$$\chi^2 = 6.83; p < .01$$

Table XX. Punitive Style: Ss vs. Ns

Whole Population

	S	N	
Intropunitive	17	31	48
Extrapunitive	17	32	49
	34	63	97

$$\chi^2 = 0$$

Table XXI. Punitive Style: Ss vs. Ns

Low-neurotic Half of the Population

	S	N	
Intropunitive	11	18	29
Extrapunitive	10	11	21
	21	29	50

$$\chi^2 = .49$$

Table XXII. Punitive Style: Ss vs. Ns

High-neurotic Half of the Population

	S	N	
Intropunitive	6	13	19
Extrapunitive	7	21	28
	13	34	47

$$\chi^2 = .21$$

Discussion

The hypothesis that extraverts should tend to be extrapunitive and introverts to be intropunitive was not confirmed. Rather, the opposite relation was found, extraverts tending to be intropunitive and introverts to be extrapunitive.

It seems probable that the hypothesis erred in failing to take into account the influence of social extraversion-introversion. While the Jungian extravert might (as we hypothesized) tend to perceive the source of frustration as external and so respond extrapunitively, the social extravert, with a high investment in maintaining relationships with other people, would tend to avoid extrapunitiveness to that end. Similarly, while the Jungian introvert might (as we hypothesized) tend to perceive the source of frustration as within himself and so respond intropunitively, the social introvert, with a low investment in maintaining relationships with other people, would be more willing than the social extravert to be extrapunitive.

Thus, whereas a positive relation between extraversion-introversion and extrapunitiveness-intropunitiveness was expected when extraversion-introversion was considered in the basic, Jungian sense, a negative relation is to be expected when social extraversion-introversion is considered. We would explain our finding of a negative relation by the fact that the Myers-Briggs is directly measuring social extraversion-introversion.

An unpredicted finding was that feeling types were significantly more intropunitive than thinking types.

A tentative explanation which suggests itself is based on the premise that in the American middle-class subculture from which the subjects were drawn, people are taught to be intro-punitive. (The possible reasons for this are too complex to discuss here, but sociologists have described the mechanism in the characteristic use of guilt as punishment by middle-class parents.) Having learned early to be intro-punitive, this tends to be their immediate, unexamined response to frustration, to blame themselves.

In the Rosenzweig the objective situation is otherwise. In each cartoon, some character other than the identification character is largely responsible for his frustration. Our tentative explanation would ascribe the finding of greater intro-punitiveness among feeling types to middle-class feeling types tending to respond to the frustrating situations on the Rosenzweig in accord with the implicit criteria supplied by their initial guilt response, an emotional product of early learning. In comparison, middle-class thinking types would more often respond to the explicit criteria supplied by the "facts" of the situation.

Support for the idea that intro-punitiveness on the Rosenzweig is in part a cultural product of the American middle-class is lent by the finding of Coons (6) that middle-class children exceeded upper and lower class children in number of intro-punitive responses on the Rosenzweig, and the finding of Takala and Takala (34) that American children similarly exceeded Finnish children.

Study III. The Welsh Revised Art Scale

The Welsh Figure Preference Test (37) consists of 400 line figures to each of which the subject responds "Like" or "Dislike." The Revised Art (RA) Scale consists of thirty figures which a group of artists liked significantly more often than people in general, and thirty figures which the artists disliked significantly more often than people in general. The figures which the artists liked tend to be complex and asymmetrical; those which they disliked tend to be simple and symmetrical. Thus a high score on the RA Scale indicates a similarity in preference to artists, and a preference for the complex and asymmetrical. Among the correlates of the RA Scale appears to be "creativity." For further discussion of this scale and its correlates, see Appendix E.

Hypotheses

Hypothesis 1: Introverts should score higher on the RA Scale than extraverts. The writer believes that a preference for symmetry is learned in western culture, as a result of the pervasive press for neatness. Support for this idea exists in the art of children, which tends to be less symmetrical and less neat than the art of untutored adults. The introvert, being less directed towards the external world, would be less responsive to its influence, in this case less responsive to the press for neatness.

Hypothesis 2: Intuitive types should score higher on the RA Scale than sensing types. The rationale for this

hypothesis is the same as the rationale for hypothesis 2 of Study I: Intuitive perception "may involve the perception of subliminal facts about the object (e.g. a pattern which cannot be made explicit by the intuitive perceiver), or the instantaneous association of unconscious 'facts' with the object." Just as the appreciation of an abstract painting is more dependent on this sort of perception than is the appreciation of a representational painting, so is the appreciation for the RA figures liked by the artists (in which the patterns present are not simple, thus not explicit) more dependent on it than the appreciation of the RA figures disliked by the artists (in which the patterns present are quite simple and explicit). The RA figures which the artists liked encourage the intuitive style of perception; the RA figures which the artists disliked are so simple and unambiguous as to make it difficult.

Method

The standard Welsh Figure Preference Test was given to the same population of 100 students who served as the subjects for Study II.

Results

The results of Study III are reported both as chi squares, the method used in Studies I and II, and as group means compared by t-tests.

The chi squares were formed as in the other studies, subjects being placed in the upper quadrants who scored above the median Welsh RA score for the whole population, the remain-

der being placed in the lower quadrants.

The "low neurotic" and "high neurotic" halves of the population are again divided at the Rotter median.

Quite simply, no significant differences were found by chi square analyses. Comparisons of mean scores of all groups had been made initially, as an informal presentation of the data, and these showed what appeared to be considerable differences in relation to both the extraversion-introversion and sensation-intuition dimensions. In light of these, we were surprised to see no significant differences revealed by the chi-square analyses, and carried out t-test analyses which, as expected, revealed significant relationships.

A case can be made for the relatively greater appropriateness of a t-test style of analysis to this study than Studies I and II. Since the dependent variable score here is a summation of choices in regard to items which were generated by a standardized statistical criterion, there is greater reason to believe that the equal interval scaling assumption of the t-test has been satisfied. To clarify this point:

On the Welsh RA, unlike on the painting preference measures used in Study I, or the modified Rosenzweig used in Study II, every score-point represents a choice differentiating the subject from the non-artist population beyond a standardized level of confidence. (The standardized level of confidence is that used by Welsh in developing the Scale.) Thus, there are realistic grounds for assuming that every score-point on the Welsh is at least approximately of equal

value to every other score point. That is, there are grounds for assuming equal-interval scaling on the Welsh RA.

The significant differences revealed by t-test analysis were the following:

1. For the high-neurotic half of the population, extraverts scored higher than introverts. Since this difference was not predicted, a two-tailed t was applied, giving a significance level beyond .05 (Figure 1, p. 53).
2. As predicted, intuitive types scored higher on the RA Scale than sensation types. This difference was significant at the .01 level for the population as a whole, and was displayed by both the low-neurotic and high-neurotic halves of the population considered separately (Figure 2, p. 54).

Both the foregoing relationships are suggested by examination of the appropriate chi-squares. (In regard to the first, see Table XXV; in regard to the second, see Tables XXVI, XXVII, and XXVIII.) However, presented as chi-squares, the relationships are not significant. This led us to further examination of our data, which revealed the following:

Those "high neurotic" extraverts who scored above the median on the Welsh RA tended to score extremely high (77% of them scoring over 10 points above the median). Conversely, those "high neurotic" introverts who scored above the median

did not score extremely high (only 31% scoring over 10 points above the median).

Intuitive types scoring above the median tended to score extremely high, while sensation types scoring above the median did not (58% of the former group scoring over 10 points above the median, vs. 31% of the latter group). Also, sensation types scoring below the median tended to score far below it, while intuitive types scoring below the median did not (71% of the former group scoring over 10 points below the median vs. 39% of the latter group).

The significant relationships revealed by the t-test analyses are the findings dealt with in the Discussion section of this chapter. They can be interpreted as indicating the degree of group tendencies, whereas the chi square findings of the previous two studies revealed the frequency of a tendency in a group.

An underlying tendency for "high neurotic" subjects to score higher on the Welsh RA than "low neurotic" subjects seems to be present. This is consistent with previous research with this instrument, and was expected.

Table XXIII. Welsh Revised Art Scale: Es vs. Is

Whole Population

	E	I	
High Welsh RA Scores	24	26	50
Low Welsh RA Scores	20	25	45
	44	51	95

$$\chi^2 = .11$$

Table XXIV. Welsh Revised Art Scale: Es vs. Is

Low-neurotic Half of the Population

	E	I	
High Welsh RA Scores	12	11	23
Low Welsh RA Scores	16	10	26
	28	21	49

$$\chi^2 = .41$$

Table XXV. Welsh Revised Art Scale: Es vs. Is

High-neurotic Half of the Population

	E	I	
High Welsh RA Scores	12	15	27
Low Welsh RA Scores	4	15	19
	16	30	46

$$\chi^2 = 2.67; p < .10$$

Table XXVI. Welsh Revised Art Scale: Ss vs. Ns

Whole Population

	S	N	
High Welsh RA Scores	14	37	51
Low Welsh RA Scores	19	28	47
	33	65	98

$$\chi^2 = 1.87; p < .25$$

Table XXVII. Welsh Revised Art Scale: Ss vs. Ns

Low-neurotic Half of the Population

	S	N	
High Welsh RA Scores	7	19	26
Low Welsh RA Scores	13	13	26
	20	32	52

$$\chi^2 = 2.92; p < .10$$

Table XXVIII. Welsh Revised Art Scale: Ss vs. Ns

High-neurotic Half of the Population

	S	N	
High Welsh RA Scores	7	18	25
Low Welsh RA Scores	6	15	21
	13	33	46

$$\chi^2 = 0$$

Figure 1. Welsh RA Scale. Es vs. Is

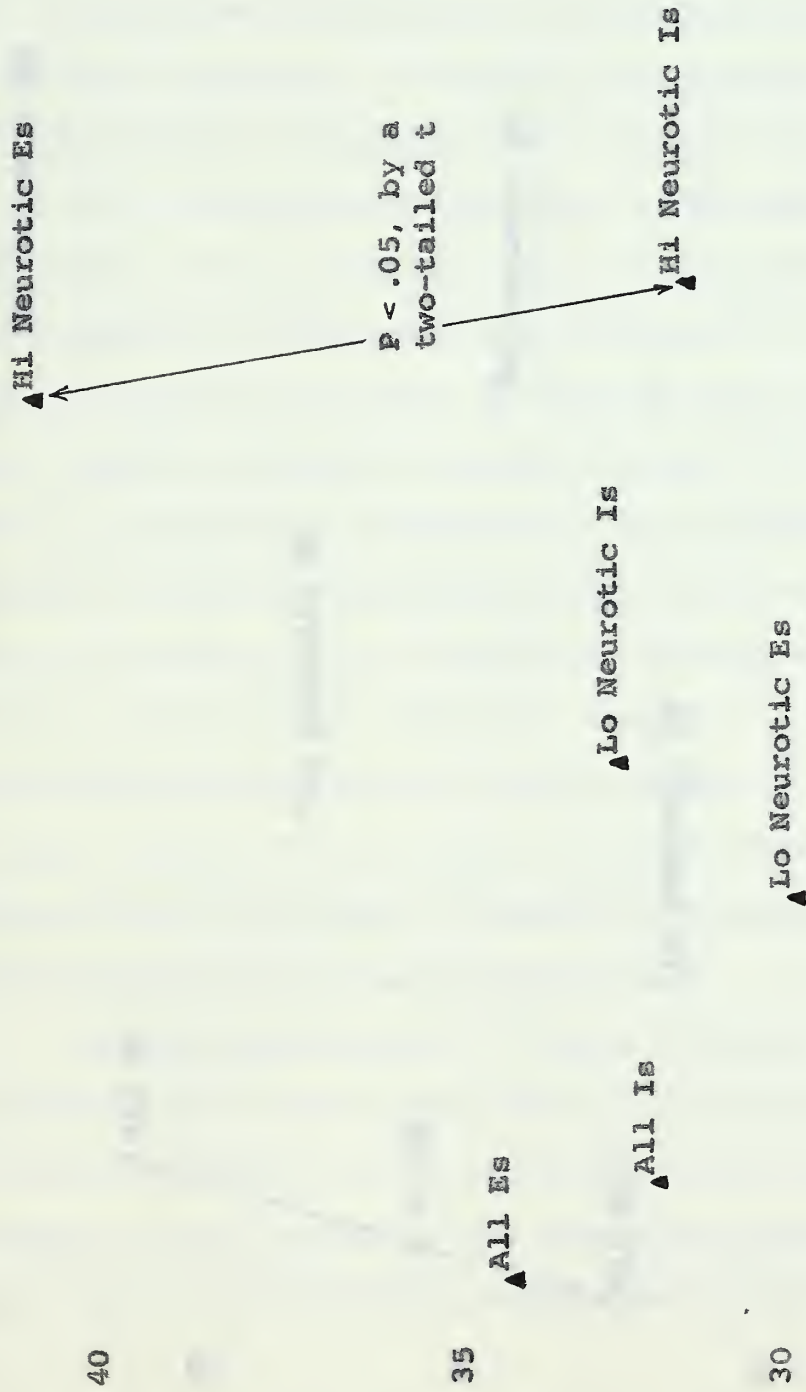


Figure 2. Welsh RA Scale: Ss vs. Ns

▲HI Neurotic Ns

▲ALL NS

▲Lo Neurotic Ns

▲HI Neurotic Ss

▲Lo Neurotic Ss

P = .01

▲All Ss

35

30

25

20

Discussion

Hypothesis 1, that introverts would score higher on the RA Scale than extraverts, was not confirmed. In the high-neurotic group, the opposite relation was found.

Here again, as in Studies I and II, we find a relation opposite to the one predicted, between extraversion-introversion and the dependent variable, for a sub-group defined by the neuroticism moderator. In Study I the opposite relation was found to hold for the high-neurotic sub-group, and was treated as serving a displacement function. (Conflict in regard to life style, and the need for covert expression of the opposite, being expected in high neurotic subjects.) In Study II the opposite relation was found to hold for the low-neurotic sub-group, and was therefore treated as being the "normal" relation. Since the case here, in Study III, is like that in Study I, the opposite-to-predicted, relation being found in the high-neurotic group, it follows that it should be treated similarly, as serving a displacement function. That is, a relation found only in the high-neurotic group cannot be taken as expressing the "normal" behavior of each type on that variable, but must rather be taken as being a displaced expression of tendencies inconsistent with "normal" type-behavior.

Unfortunately here, unlike in Study I, the predicted relationship did not appear for the low-neurotic group. It is therefore difficult to say what might be the "normal" type-behavior on this variable, the suppressed opposite of which is being expressed here by the high-neurotic group.

Our initial prediction was based on the hypothesis of a tendency to conformity (in this case, to the cultural press for neatness and symmetry) among extraverts. While this hypothesis was not confirmed in the low-neurotic group, neither was it disputed, the insignificant relation which obtained in the low-neurotic group being in the predicted direction. It may be that the hypothesized tendency (of extraverts to conform more to a cultural press for neatness and symmetry) exists, but not strongly enough to significantly influence their performance on the RA Scale. The suppressed tendency toward the opposite (the rebellion against this cultural press) in high-neurotic extraverts may, however, have been sufficient to significantly influence their performance on this measure, it serving a covert, displacement function for them.

The above--that high-neurotic extraverts have a strong, suppressed tendency to rebel against the cultural press for neatness and symmetry--is the explanation we suggest for our finding that high-neurotic extraverts score higher than high-neurotic introverts on the Welsh RA Scale. It must remain only a suggested explanation, until the initially predicted "normal" tendency is demonstrated to exist in low-neurotic subjects.

Hypothesis 2, that intuitive types would score higher on the RA Scale than sensation types, was strongly confirmed, beyond the .01 level of significance.

Welsh describes the RA Scale figures liked by artists as being more "complex" than those disliked by artists. Golann (20) demonstrated that they were more "ambiguous"--which one

would expect to be highly correlated with complexity--and it is probably this characteristic which is relevant here.

The rationale on which this hypothesis was based was the greater suitability of the positive RA Scale items to the intuitive style of perception. A similar rationale was used for hypothesis 2 of Study I--namely, the greater suitability of abstract paintings to the intuitive style of perception--and that hypothesis was also confirmed. I would propose that the factor held in common by abstract (vs. representational) paintings and positive (vs. negative) RA Scale items, making them both more suitable to intuitive perception, is their "ambiguity."

The two findings mentioned above, plus Knapp and Wulff's (23) finding of a similar relation between intuitive type and preference for abstract paintings, now form a body of research relating the intuitive type (and, specifically, the N category of the Myers-Briggs) to a preference for ambiguity.

When the above is considered in relation to Knapp and Wulff's (23) description of their devotees of abstract art as "a more talented, sensitive and symbolically adroit group," Welsh's findings relating creativity to high scores on the RA Scale, and MacKinnon's (Reported in Myers, 26) finding that creative people in high-level occupations tend to be intuitive, a pattern relating intuitiveness, preference for ambiguity, and creativity begins to appear.

Summary Discussion and Suggestions for Future Research

Each type-pair will be discussed separately: In regard to the attitudes, we failed to find the expected relations between extraversion and preference for representational painting, and between extraversion and relatively low scores on the Welsh RA Scale. That is, we failed to find the greater liking for external reality, and the greater responsiveness to its standards, described by Jung as characteristic of the extravert.

We did find low neurotic extraverts to like paintings of people better, and a suggestion that they were more intro-punitive in a simulated interpersonal situation, than their introverted counterparts. We would interpret this to indicate that extraverts not only like people in general better, but are more interested in maintaining good relations with them, than are introverts. These relationships, then, relate to social extraversion-introversion.

This finding that extraversion-introversion scores on the Myers-Briggs related to correlates of social extraversion-introversion (to a liking for, and "pleasant" interaction with, people), and not to correlates of extraversion-introversion in the more basic Jungian sense of a general preference for the external or internal world, led us to re-examine the Myers-Briggs. It was concluded that the Myers-Briggs items were directly measuring only social extraversion-introversion, being in this like other existing extraversion-introversion, measures, such as the introversion scale of the Maudsley Personality

Inventory, and the social introversion scale of the MMPI. It is suggested, therefore, that a new scale of extraversion-introversion is needed, if adequate research with the attitudes in their Jungian sense is to be done. Suggested items for such a scale would include the following:

	<u>Extravert</u>	<u>Introvert</u>
1. Word choice:	facts	theories
	realism	idealism
	action	thought
	concrete	abstract
	popular	individual
	useful	appealing
	objective	subjective

2. If you were doing research, would you most enjoy planning the experiment (introvert) or looking at the results (extravert)?

3. Do you subscribe to this statement: "The majority is usually right"? Yes (extravert). No (introvert).

4. With your close friends, do you prefer to spend your time in conversation (introvert) or doing things together (extravert)?

5. Do you admire more the man who has benefitted mankind (extravert) or the man who has lived according to ideals you respect (introvert)?

6. Would you rather read a history book which described great events in detail (extravert), or one which devoted itself largely to discussing their implications (introvert)?

Returning to our findings, we can say from them that low neurotic subjects who describe themselves as socially extraverted or introverted on the Myers-Briggs will tend to have artistic preferences biased in accord with this, and to respond with an appropriate punitive style in a frustrating interpersonal situation. That is, we can say that low neurotic subjects tend to express their preference for social extraversion or introversion consistently across rather varied measures.

This is not the case for high neurotic subjects. They do not more often utilize the punitive style appropriate to the social attitude which they choose on the Myers-Briggs, and their artistic preferences are biased in the opposite direction. We would explain this lack of consistency across measures as due to a high neuroticism score reflecting a high degree of conflict in regard to one's style of life. The high neurotic social extravert is not altogether satisfied with being an extravert, nor is the high neurotic social introvert satisfied with being an introvert. They may choose to see and describe themselves as having one social attitude, but be unable to behave consistently with that attitude in an emotionally charged frustration situation. As has been suggested by Wallach, they may utilize such a relatively private expression of personal style as artistic preference to gain covert satisfaction of needs

which are overtly concealed. (Artistic preference is "private," as compared to the Myers-Briggs, in the sense that by disliking a portrait you are not saying openly that you tend to be uncomfortable with people, nor by liking a portrait are you admitting openly that you need other people.)

In sum, the findings in regard to extraversion-introversion suggest that the Myers-Briggs measures only social extraversion-introversion directly; that for low neurotic subjects a preference for social extraversion or introversion tends to be expressed consistently across measures; that for high neurotic subjects this consistency is not present, and that these subjects in fact tend to express covertly the opposite of their overt preferences.

In regard to the judging functions, thinking and feeling, the reader may have been struck by their failure to generate hypotheses--in this research, no specific prediction about the effect of these functions was made. This, I think, is related to the nature of the criteria differentiating this type-pair: theoretically, the attitudes may be differentiated by the degree of reliance on external criteria, the perceiving functions by the nature of the stimuli preferred, but the judging functions relate to the consciousness of the subject of criteria for his judgment at the moment he makes it.

This suggests a questionnaire method, but that would run into the same problems as the attempts to study "learning without awareness"--the differing ability of subjects to report accurately and honestly on their experience at a moment

in the past, and the different interpretations given questionnaire items by subjects. More important, in relation to this research, we would no longer be dealing with variables of personal style.

A solution to this research problem may be suggested by the one finding we obtained in regard to the judging functions, i.e., feeling types being more intro-punitive, in the simulated interpersonal situation provided by the Rosenzweig, than thinking types. We offered the explanation that feeling types were more responsive to a "subconscious" general tendency, learned early in American middle-class culture, to be intro-punitive in all interpersonal situations, while thinking types were more responsive to the objective facts that in the Rosenzweig situations the frustration was in each case the fault of someone else. If this explanation is correct, it suggests the nature of future hypotheses in regard to the relation of the judging functions to personal style variables. In situations in which the objective facts encourage one preference, and a known "subconscious" tendency another, thinking types will be relatively more responsive to the facts while feeling types will be relatively more responsive to their "subconscious."

The findings in regard to the perceiving functions, sensation and intuition, are consistent and satisfying. Two hypotheses were generated, that sensation types would prefer representational paintings, as compared to abstract paintings,

to a greater extent than intuitive types, and that sensation types would score lower on the Welsh RA Scale. Both hypotheses were confirmed (although, in the case of the former, the results only attained significance when the high neurotic subjects were excluded). The meaning of these results, taken together, has been discussed briefly in the discussion section of Study III. It is our contention that they evidence a relation between intuition and preference for ambiguity.

This research in regard to the perceiving functions exemplifies the sort of thing we would hope for from future research with the Typology. In supporting hypotheses derived directly from the Typology, the findings provide some evidence for the generality and descriptive value of the Typology. At the same time, they serve to clarify the Typology, in demonstrating that the differing perceptual styles of intuitive and sensation types imply differing object preferences. Finally, taken together, they suggest the nature of the difference in object preference, namely that intuitive types prefer more ambiguous objects.

An essential characteristic of this research, in order that it accomplish the ends described above, is that it tested hypotheses clearly derivable from the Typology, but not already a part of the Typology or the independent measure used.

The Typology characterizes the perception of the intuitive type as going beyond the obviously given nature of the object, the perception of the sensation type as lacking this quality. From this we derived the hypothesis that each

type would show a greater preference for objects which, by their nature, appeared to encourage their style of perception. This hypothesis, while clearly derivable, was not already a part of the Typology, not a necessary correlate of Jung's characterization of the types; it was possible, before research indicated otherwise, that intuitive and sensation types could not be differentiated by the objects which they prefer, but only by their preferred perceptual style.

Had we attempted to test the statement, already a part of the Typology, that people differ in their perceptual styles, say by an item analysis of the Myers-Briggs, or by giving a second questionnaire, we could only hope to discover the consistency of our measuring devices; we could not hope to say anything new about the Typology. By instead accepting the information provided by our independent measure (while granting its fallibility) and testing hypotheses derivable from, but not already a part of, the Typology, we were able to extend and clarify the theory.

It is appropriate here to point out the extent to which the productivity of this research was dependent on the application of a neuroticism moderator: Three of the six significant relationships reported here, including two of the three relating a dependent variable to extraversion-introversion, were revealed only after application of the neuroticism moderator. This leads the writer to a belief in the necessity of taking neuroticism into account in future research with the Typology. Jung's description of his Typology included the

recognition that type-expression would be inconsistent in neurotics, a facet of the Typology which, our findings make clear, has been unwisely overlooked by researchers.

Summing up, this research has strengthened the writer's belief that the Jungian Typology is potentially useful both heuristically and descriptively. In regard to future research with the Typology, the utility of a neuroticism moderator variable, and the suitability of variables of personal style as dependent variables, were demonstrated. The need for a new instrument which directly measures extraversion-introversion in the Jungian sense became apparent. A more basic problem, the lack of tightness of the theory, making clear-cut predictions impossible in regard to some variables, was also apparent. Such tightness can only be gained by extensive further research. The productivity of the research reported here, despite these problems, makes further research seem worthwhile.

An enlargement of Studies II and III, involving an additional subject population of approximately 100, is now in progress. This will not only provide further evidence in regard to the relationships reported here, but will enable us to investigate potentially relevant moderating variables, such as sex difference, and combinative type comparison (e.g. extraverted thinking types vs extraverted feeling types, etc.)

In all three of the current studies, sex differences were looked at. It was clear that no relationship between type and a dependent variable was a product of sex differences

in type membership. However, while small sub-group sizes made interpretation uncertain, it did appear that some relationships between type and a dependent variable existed more strongly in one sex than another, and further that new relationships might be revealed by consideration of adequate sample sizes of each sex separately.

APPENDIXES

APPENDIX A

The Myers-Briggs: An Empirical Measure of the Typology

The problem of choosing a direct measure of the Typology was made somewhat simple by the fact that only two such measures have been developed, the Gray-Wheelwright and the Myers-Briggs Type Indicator. The Myers-Briggs was chosen because it had been better validated.

The Myers-Briggs consists of 165 multiple-choice self-descriptive items, each of which is scorable on one of four scales. The scales are "extraversion-introversion" (E-I), "thinking-feeling" (T-F), "sensing-intuiting" (S-N), and "judging-perceiving" (J-P). Scores on the first three scales identify a subject's position in regard to each of the categories of the Typology, while the fourth scale locates the dominant function--if a subject is classified "J" by the J-P scale, whichever of his judging scales (T or F) predominates is taken to be his dominant function: if he is classified "P," whichever of his perceiving scales (S or N) predominates is taken to be his dominant function.

For each scale the score consists of a letter (E or I, T or F, S or N, J or P) indicating in which direction most items have been answered, and a number, indicating the difference

between the number of items answered in that direction and the number of items answered in the opposite direction.

The author says, "The letter is considered the most important part of the score, as indicating which of the opposite sides of his nature the person prefers to use," and, "the numerical portion of a score shows how strongly the preference is reported, which is not necessarily the same thing as how strongly it is felt."

This emphasis was accepted in the research reported here, and the Myers-Briggs scores were taken to indicate direction, but not necessarily degree, of preference. Our aim was to see if people classified in opposed categories of the Typology showed consistent differences on other measures, not to see whether numerical scores on the Myers-Briggs correlated with numerical scores on other measures.

The author reports "logically-split-halves" reliability correlations for several populations on each of the scales. These are creditable, with 25 of the 40 correlations reported being above .80, and all but two being above .70.

As validating data, the author reports significant correlations of Myers-Briggs scales with scales of the Strong-Vocational Interest Blank, the Allport-Vernon-Lindzey Study of Values, the Edwards Personal Preference Schedule, the Personality Research Inventory, and faculty ratings of student characteristics. The correlates of the Myers-Briggs scales on these other measures are usually consistent, and never clearly inconsistent, with the relevant category of the Typology. For

example, being an E was shown to relate to the "Business contact" vocational category on the Strong, to emphasis of "Economic" and "Political" values on the A-V-L to "Exhibition" and "Dominance" on the EPPS, to "Gregariousness" on the PRI, etc.; while being an I was shown to relate to the "Technical-scientific" vocational category on the Strong, to emphasis of the "Theoretical" and "Aesthetic" values on the A-V-L, to "Order" on the EPPS, etc.

(It is worth noting that, while a survey of the Myers-Briggs E-I items makes it clear that this scale is primarily measuring social extraversion-introversion, some of the correlates of E-I above are more predictable from Jungian than social extraversion-introversion. For instance, the relation of E to economic interests, and the relation of I to theoretical interests and desire for order, are more predictable from Jungian theory than from sociophilia and sociophobia. Correlations such as these may be explained by the high correlation of social extraversion and introversion, as measured by the Myers-Briggs, to the Jungian attitudes. The Myers-Briggs, that is, probably measures Jungian extraversion-introversion, but adds error variance by measuring it indirectly.)

While the validating correlates of the Myers-Briggs are good, a notable flaw is apparent. The correlated measures, with the exception of the faculty ratings, are like the Myers-Briggs in consisting of self-descriptive verbal items. It has not been demonstrated that the correlates of the Myers-Briggs extend to non-verbal items, and to actual behavior. Two of

the variables used in the research reported in this paper (namely, the painting preferences and the Welsh RA scale) help to correct this flaw, being non-verbal and getting at the subject's preferences directly rather than by self-description.

APPENDIX B

The Rotter Incomplete Sentences Blank: A Neuroticism Moderator Variable

The Rotter consists of forty items which are completed by the subject. Each completion is scored from 0-6 as to "conflict." The scoring is done with the aid of a manual which includes examples of completions in each scoring category for each item. By referring to these, and keeping the general criteria for each scoring category in mind (essentially, scores from 4 to 6 are applied to completions reflecting increasing degrees of "conflict," 3 is applied to a "neutral" response, and 2 to 0 are applied to increasingly "positive" responses) a high degree of interscorer reliability (.92 in our case) can be obtained.

There were two primary reasons for choosing the Rotter in preference to other neuroticism measures--it did not, on the face of it, correlate with introversion (i.e., a subject could not, as in the case of some other neuroticism measures, obtain a score in the neurotic direction on an item simply by answering as an introvert rather than an extravert); and it claimed to measure neuroticism via "conflict," the appropriate criterion for our purposes. In fact, both these hoped-for assets proved to be partly illusory, but no better neuroticism measure is available.

While Rotter scoring was not obviously related to extraversion-introversion, our subjects' Rotter scores correlated $-.16$ with extraversion-introversion on the Myers-Briggs. This correlation may be explained by a bias towards extraversion in the Rotter scoring examples given, a positive response to other people typically getting a "positive" score, a preference for isolated pastimes often getting a "conflict" score. It may be too, though, that it is easier to be an extravert in our extraverted culture, and that introverts in this culture tend to be more neurotic, in the genuine sense of a greater degree of inner conflict.

The Rotter's measuring neuroticism via "conflict" was also partly illusory, in that conflict is measured only indirectly, the examples of completions scored for "conflict" being characterized by negativity and discontent rather than by actual conflicting tendencies.

Despite these flaws, the Rotter appears to come as close as any existing instrument to measuring neuroticism in the sense of inner conflict. In practice, the dividing of subjects into high-neurotic and low-neurotic groups by the use of the Rotter has revealed patterns, in this and other research with the Typology, which would otherwise have been undiscovered.

APPENDIX C

Paintings Used in Study I

Representational Paintings:

<u>Artist</u>	<u>Painting with People Prominent</u>	<u>Painting with People Not Prominent</u>
Bonnard	Woman and Dog	The Open Window
Corot	Portrait of the Artist	The Coliseum, Rome
Courbet	Women at the Banks of the Seine	Rocks at Omans
Fantin-Latour	Sonia	Still Life: Melons and Fruit
Gauguin	And the Gold of Their Bodies	Tahitian Landscape
Homer	Prisoners from the Front	Weatherbeaten
Monet	Madame Gaudibert	Canal of Zaandam
Renoir	Bal a Bougival	Church at Cagnes
Van Gogh	Self-Portrait	Market Gardens
Wyeth	Children's Doctor	Down Below Dover

Abstract Paintings:

<u>Artist</u>	<u>Paintings</u>	
Balla	Speeding Automobile	Study: The Street Light
Baumeister	Homage to Jerome Bosch	Kessua
Boccioni	States of Mind: Those Who Stay	The City Rises
Ernst	Mundus est Fabula	Nature at Daybreak
Hofmann	X-155	St. Francis 1952
Klee	Little Town Houses	Landscape with Dam
Leger	The City	Still Life 1924
Miro	Catalan Landscape	Dutch Interior
Picasso	Fruit Dish and Pitcher	Serenade
Pollock	Male and Female	No. 6

APPENDIX D

The Forced-Choice Modification of the Rosenzweig Picture Frustration Study

The development of the forced-choice modification consisted simply of making up a list of alternative responses, six for each cartoon, from which the subject could choose.

The six alternative responses offered for each cartoon were categorized in regard to "direction of aggression." Of the six, two were always extrapunitive, two intro-punitive, and two impunitive.

A further breakdown classified the responses as to reaction type. Three of the six responses offered (one response in each of the three "direction of aggression" categories) were not always of the "need persistent" reaction type. The other three responses were of the "obstacle dominant" reaction type for twelve of the twenty-four cartoons, and of the "ego-defensive" reaction type for the other twelve.

The method of obtaining categorized responses is described in the following paragraph.

The list of alternative responses was made up with the aid of a selection of sample answers chosen by Rosenzweig (Rosenzweig et al., 31), as exemplifying each of his response categories, for each of the twenty-four cartoons. Responses

were adapted directly from Rosenzweig's selections whenever possible. Often some re-wording was necessary, in the author's view, to make a response potentially attractive to our subject population (e.g. to give it grammatical adequacy). In several cases, when no appropriate response in a required category was given by Rosenzweig for a cartoon, a response in that category was made up by the author. In most such instances the response was made up by re-wording a response in the required category, given by Rosenzweig for another cartoon. Finally, some items were modified in accord with suggestions from two members of the psychology department and two graduate students, such that each item at last received the approval of all concerned as correctly exemplifying the category intended.

And what did we come up with as a result of all this tsuris? An odd-even reliability check, corrected for length, indicated a reliability of .72, which is not very good.

APPENDIX E

The Welsh Revised Art Scale

The Welsh Figure Preference Test consists of 400 line figures to each of which the subject responds "Like" or "Dislike." It was intended by Dr. Welsh that it serve as an item pool for the empirical development of MMPI-like scales, which would have the advantages of being language-free, and hopefully relatively culture-free. Attempts at clinical diagnostic scales have not, so far, been productive, but the "Art" scales (initially the "Barron-Welsh," and later, a revision, the "Revised Art Scale") have stimulated a good bit of interesting research.

In their initial efforts to develop a figure preference test, Barron and Welsh (1) discovered that two factors seemed to account for most of the variance in the scores of their standardization group, a general tendency to either like or dislike the figures, and "a second bipolar factor, orthogonal to the first, whose poles (as determined by inspection of the figures) seemed to be simplicity-symmetry and complexity-asymmetry" (*ibid.*, p. 200). Welsh discovered apparent personality differences between subjects scoring at opposite extremes of this second factor, and noted that the several artists in

the standardization group all scored towards the "asymmetry-complexity" extreme. With this information as impetus, Barron and Welsh went on to develop the original Barron-Welsh Art Scale as follows:

Thirty-seven artists and art students and 150 "people in general" were given the 400 items of the Welsh Figure Preference Test. A scale was developed consisting of 40 items disliked by artists significantly more often than people in general, and 25 items liked by artists significantly more often than people in general. "An inspection of these items showed all 40 of the items disliked by artists to be of the simple-symmetrical sort, while almost all of the items that they liked significantly more often were complex-asymmetrical" (*ibid.*, p. 201-202).

The Barron-Welsh Art Scale, while successful at discriminating artists from non-artists, and productive of experimental correlates, was flawed in that it included more "dislike" than "like" items, so that a general tendency to dislike all items on the Figure Preference Test would tend to produce a high score on the Art Scale. Welsh (37) developed the Revised Art Scale to correct this bias. From a large group of people-in-general, two sub-groups were selected, one group scoring in the upper 10% of Barron-Welsh Art Scale Scores and one group scoring in the lower 10%, but both groups scoring near the mean on total number of items disliked. By an item analysis, a scale consisting of 30 items liked, and 30 items disliked, significantly more often by the high scoring group

was developed. This, the Revised Art Scale used in Study III, correlated .85 with the original Barron-Welsh Art Scale, but is orthogonal to any general tendency to like or dislike items.

Given the high correlation between the Barron-Welsh and the Revised Art scales, plus the fact that the "like" items on both scales are described as more complex and asymmetrical than the "dislike" items, we assume them to be measuring the same thing.

A consistent correlate of both scales is "creativity" or "originality." Barron (3) says high scores on the Barron-Welsh are related to "originality, verbal fluency, expression as opposed to repression of impulse, and to cathection of intellectual activity." He reports (2) a correlation of .30 between scores on the Barron-Welsh and faculty ratings of originality of Ph.D. candidates in scientific fields. Rosen (30) reports a correlation of .40 between Barron-Welsh scores and faculty ratings of originality of art students. Welsh (37) found the Revised Art Scale to correlate .40 with instructors' ratings of creativity of students in an undergraduate course in creative writing.

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